Nicholas Bryson

From: Stan Shelly [stanshell99@toast.net]
Sent: Tuesday, July 19, 2005 9:17 PM
To: Tom Resor; Adam Simms; Nicholas Bryson
Subject: Modified Carwash Noise Modeling @ Toyota of Sunnyvale

Nick/Adam/Tom-

I was notified by Tom about the concerns of the Planning Dept about the distance estimates I used in doing the previous noise model calculations of the reverse flow design (cars coming in from El Camino). I think my original distances are fairly accurate (there is little difference in 38 and 40 feet, and my estimates of the side door is not to the door jamb but to the center of the door, so 30 feet is about right). However, I have modified the model somewhat to allow for the corrections to the drawing I had with the existing wing wall and restrooms near where the carwash will be. I have been notified that the restrooms will be removed and the blower will be on the other side of the carwash line away from the door. The slightly modified noise estimates are provided below.

With the "quietest" version of the blowers installed, and smallest effective doors installed, then without further mitigation measures the blower noise levels are calculated to be (dBA):

* Back property line - residential 59 - 61
  (very close to 60 Daytime, but not within 50 Nightime limit)
* Side property line - motel 64-66
  (close to present Ldn ambient, and ~5 dB over 60 Ldn planning standard)

Be aware that these are noise estimates and subject to several source of inaccuracy, particularly in the use of blower noise measurements I have not validated myself.

Please let me know if you need further information or assistance on this project.

Regards,

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May 1, 2005

Mr. Adam Simms
Sunnyvale Toyota
898 West El Camino Real
Sunnyvale, CA 94087

Re: Noise Assessment and Mitigation Study –Sunnyvale Toyota Carwash Installation, 898 West El Camino, Sunnyvale

Dear Mr. Simms,

At your request I have evaluated the noise generated by the proposed carwash installation in the existing Service Building 1 at the east end of the dealership site. This report presents the results of the noise study, the relevant City of Sunnyvale noise ordinance and planning standards, and general recommendations for mitigation measures to allow compliance with City noise standards. The four blowers at the exit of the carwash are the key noise-producing elements of the installation. The two primary sensitive receptor locations near the carwash are two-story apartments adjacent to the dealership property to the south, and also a motel adjacent to the site to the east.

PROPOSED CARWASH INSTALLATION

The proposed carwash installation would have a one-car entrance in the middle of the west side of Building 1 and a two-car exit end at the front of the building facing El Camino Real [1][2]. One of the car exits would be for the automatic carwash, including a 40 Hp 4-blower unit, while the other exit would be for a custom detail operation next to the carwash. The entrance would be about 100 feet from the rear property line and the adjacent residential apartments. The planned carwash installation would locate the blowers within 1 foot of the exit door, placing the blowers within about 40 feet of the El Camino sidewalk and also about 15 feet from the adjacent motel property to the east.

AMBIENT NOISE MEASUREMENTS

Noise measurements were on the dealer site on the morning of April 12, 2005, with a CEL-440 Precision Noise Meter and Analyzer, calibrated with a B & K Model 4230 Sound Level Calibrator. Two measurement locations were chosen to represent the worst case exposures of residential units closest to the proposed carwash installation. Measurements were made at the following representative locations:

Location 1 –. On the east property line shared with the Quality Inn, about 40 feet from the nearest lane of El Camino Real.

Location 2 – . Next to the 7 foot masonry wall and the detail stalls on the south property line shared with the adjacent apartments

Description of Existing Noise Levels

Noise levels were measured and are reported using percentile noise descriptors: L_{90} (the background noise level exceeded 90 % of the time), L_{50} (the median noise level exceeded 50% of the time), L_1 (the peak level exceeded 1% of the time), and L_{eq} (the average energy-equivalent noise level). Measured noise levels

are presented in Exhibit 1 following. The L_{dn} noise levels were computed as the long-term average of L_{eq} using the typical daily traffic distribution in the area, with standard weighted penalties for the nighttime hours.

EXHIBIT 1
EXISTING NOISE LEVELS (dBA)
Sunnyvale Toyota Project Site – West El Camino Real

Location	L_{90}	L_{50}	L_{eq}	L_1	L_{dn}/ CNEL
1 – east property line – near El Camino Real	54	62	63	71	64
2 – south property line	55	58	59	64	60

Location 1 noise is dominated by El Camino traffic noise. Noise levels at location 2 are affected somewhat by El Camino traffic, but it is about 225 feet away, so dealership noises in the detail area and in the parking lot are more important at this location.

CARWASH NOISE INFORMATION

The best information about the noise levels that would be produced by the planned 4x10 hp carwash blowers is as follows:

1. Measurements by the carwash distributor , with carwash in a 16 foot wide carwash bay with 16 foot sides and no top: 94 dBA at 25 feet, and 92 dBA at 50 feet
2. Measurements by ECS of a San Jose auto dealer installation (with three small blowers without an enclosure): 82 dBA at 25 feet
3. Shell Camarillo noise measurements by NuStar (unknown model): 88 dBA at 20 feet.

Based on this blower information, which was measured by different people under different conditions, it is estimated that the proposed installation would create a noise level of 88 dBA at the adjacent motel property line when the blowers are operating. The dealership estimates that 125 vehicles per day will be washed and dried. The carwash distributor says the most common setting allow the blowers to operate for approximately 60 seconds for each vehicle [2].

The noise level at the back residential property line with the proposed installation would be 58-60 dBA from the carwash operation.

COMPLIANCE WITH CITY OF SUNNYVALE NOISE STANDARDS

The Sunnyvale regulations applicable to the residential property noise is Municipal Code, Section 19.42.030 [4], is as follows:

> (a) Operational noise shall not exceed 75 dBA during at any point on the property line of the premises upon which the noise or sound is generated or produced; provided, however, that *the noise or sound level shall not exceed fifty dBA during night time or sixty dBA during daytime hours at any point on adjacent residential- zoned property.*

Sunnyvale Toyota Carwash Installation Noise Study

From Section 19.12. Definitions, "Daytime hours" are defined as 7 am to 10 pm, and "Nighttime hours" are defined as 10 pm to 7 am.

The Sunnyvale regulations that apply to noise on commercial residential property such as hotels and motels is the adopted Noise Guidelines for Land Use Planning (Table 2) of the Noise Element [5], which recommends an noise level of 60 dBA Ldn / CNEL or less for hotel and motel land uses. The Ldn/CNEL is a long term energy average noise level. Note that from Exhibit 1 the present Ldn noise level at the motel property line near the carwash location is 64 dB from the El Camino traffic.

RECOMMENDED MITIGATION MEASURES

Under the present plans the operation of the carwash would produce a noise level at the motel property line of approximately 88 dBA, which, under the expected use of the carwash would produce a 78 Ldn/CNEL at the property line. This requires a reduction of at least 18 dB to get down to the required 60 dBA CNEL Sunnyvale guideline. To achieve this significant amount of noise reduction, the following types of changes to the design are recommended:

1. Move carwash bay and blowers away from the motel property line (switch bays with the detail bay).
2. Install heavy vinyl "drive-through" strip doors over the carwash exit.
3. Move blowers back from doorway one car length, so that the vinyl strip doors are closed while blowers are On for each car.
4. Install a separate rollup door for the detail bay exit with noise reduction materials on back. Keep door closed except when needed to bring car out.
5. Install a property line masonry wall at least 6 feet high adjacent to carwash exit.
6. The carwash distributor also has provided information on a Hurricane blower model that appears to be about 6 dB quieter than the Broadway type typically used.

These mitigation measures would provide a noise reduction of 18-24 dB, allowing the carwash to meet the Sunnyvale noise planning limits. Please let me know if I can be of further assistance on this project.

Respectfully submitted,

Stan Shelly

H. Stanton Shelly
Acoustical Consultant
Board Certified Member (1982)
Institute of Noise Control Engineering

CC: George Avanessian Associates